

CLAIM AMENDMENTS

Please amend the claims by amending claims 1, 13, and 25 and adding new claims 36-64, all without prejudice, as indicated on the following listing of all the claims in the present application after this Amendment:

- 1.(Presently Amended) A method for determining the slope of a first field pixel from a first field of a video signal, the method comprising:
downscaling in the horizontal direction while maintaining the scaling in the vertical direction one or more sets of field pixels from said first field to generate one or more downscaled field pixels; and
detecting the slope of the first field pixel using the one or more downscaled field pixels.
- 2.(Original) The method of Claim 1 wherein the one or more sets of field pixels includes a first set of field pixels, the first set of field pixels including field pixels from a field line having the first field pixel.
- 3.(Original) The method of Claim 1 wherein the one or more sets of field pixels includes a second set of field pixels, the second set of field pixels including field pixels from a field line above a field line having the first field pixel.
- 4.(Original) The method of Claim 1 wherein the one or more sets of field pixels includes a third set of field pixels, the third set of field pixels including field pixels from a field line below a field line having the first field pixel.
- 5.(Original) The method of Claim 1 wherein downscaling comprises averaging a first set of field pixels, the first set of field pixels including at least 3 field pixels from a field line having the first field pixel.

6.(Original) The method of Claim 1 wherein downscaling comprises averaging a second set of field pixels, the second set of field pixels including at least 3 field pixels from a field line above a field line having the first field pixel.

7.(Original) The method of Claim 1 wherein downscaling comprises averaging a third set of field pixels, the third set of field pixels including at least 3 field pixels from a field line below a field line having the first field pixel.

8.(Original) The method of Claim 1 wherein downscaling comprises low-pass filtering a first set of field pixels, the first set of field pixels including at least 3 field pixels from a field line having the first field pixel.

9.(Original) The method of Claim 1 wherein downscaling comprises low-pass filtering a second set of field pixels, the second set of field pixels including at least 3 field pixels from a field line above a field line having the first field pixel.

10.(Original) The method of Claim 1 wherein downscaling comprises low-pass filtering a third set of field pixels, the third set of field pixels including at least 3 field pixels from a field line below a field line having the first field pixel.

11.(Original) The method of Claim 1 wherein detecting comprises:
high-pass filtering the downsampled field pixels to generate a detected value; and
comparing the detected value to a threshold value.

12.(Original) The method of Claim 1 wherein detecting comprises:
high-pass filtering at least 3 downsampled field pixels using a $[-1/4, 1/2, -1/4]$ high pass filter to generate a detected value; and
comparing the detected value to a threshold value.

13.(Presently Amended) A circuit for determining the slope of a field pixel, the circuit comprising:

a plurality of downscale circuits, each downscale circuit coupled to receive one or more sets of field pixels from a first field of a video signal, and each downscale circuit operable to generate one or more downsampled field pixels from the one or more sets of field pixels, wherein said downsampled field pixels are downsampled in the horizontal direction while maintaining the scaling in the vertical direction; and

a plurality of edge detector circuits, each edge detector circuit coupled to receive one or more downsampled field pixels from a respective downscale circuit and detect the slope of a field pixel from said first field therefrom.

14.(Original) The circuit of Claim 13 wherein the one or more sets of field pixels include a first set of field pixels, the first set of field pixels including field pixels from a field line having the first field pixel.

15.(Original) The circuit of Claim 13 wherein the one or more sets of field pixels include a second set of field pixels, the second set of field pixels including field pixels from a field line above a field line having the first field pixel.

16.(Original) The circuit of Claim 13 wherein the one or more sets of field pixels include a third set of field pixels, the third set of field pixels including field pixels from a field line below a field line having the first field pixel.

17.(Original) The circuit of Claim 13 wherein each downscale circuit averages a first set of field pixels, the first set of field pixels including at least 3 field pixels from a field line having the first field pixel.

18.(Original) The circuit of Claim 13 wherein each downscale circuit averages a second set of field pixels, the second set of field pixels including at least 3 field pixels from a field line above a field line having the first field pixel.

19.(Original) The circuit of Claim 13 wherein each downscale circuit averages a third set of field pixels, the third set of field pixels including at least 3 field pixels from a field line below a field line having the first field pixel.

20.(Original) The circuit of Claim 13 wherein each downscale circuit low-pass filters a first set of field pixels, the first set of field pixels including at least 3 field pixels from a field line having the first field pixel.

21.(Original) The circuit of Claim 13 wherein each downscale circuit low-pass filters a second set of field pixels, the second set of field pixels including at least 3 field pixels from a field line above a field line having the first field pixel.

22.(Original) The circuit of Claim 13 wherein each downscale circuit low-pass filters a third set of field pixels, the third set of field pixels including at least 3 field pixels from a field line below a field line having the first field pixel.

23.(Original) The circuit of Claim 13 wherein each edge detector circuit includes a high-pass filter.

24.(Original) The circuit of Claim 13 wherein each edge detector circuit includes a $[-1/4, 1/2, -1/4]$ high pass filter.

25.(Presently Amended) A method for determining the slope of a first field pixel from a first field of a video signal, the method comprising:

downscaling in the horizontal direction while maintaining the scaling in the vertical direction a first set of field pixels from said first field to generate a first downsampled field pixel;

downscaling in the horizontal direction while maintaining the scaling in the vertical direction a second set of field pixels from said first field to generate a second downsampled field pixel;

downscaling in the horizontal direction while maintaining the scaling in the vertical direction a third set of field pixels from said first field to generate a third downsampled field pixel; and

detecting the slope of the first field pixel using the first downsampled field pixel, the second downsampled field pixel, and the third downsampled field pixel.

26.(Original) The method of Claim 25 wherein the second set of field pixels are positioned in a field line above a field line having the first field pixel and the third set of field pixels are positioned in a field line below the field line having the first field pixel.

27.(Original) The method of Claim 25 wherein the second set of field pixels includes at least 3 field pixels that are positioned in a field line above a field line having the first field pixel and the third set of field pixels includes at least 3 field pixels that are positioned in a field line below the field line having the first field pixel.

28.(Original) The method of Claim 25 wherein downscaling the first set of field pixels to generate a first downsampled field pixel comprises averaging the first set of field pixels.

29.(Original) The method of Claim 25 wherein downscaling the second set of field pixels to generate a second downsampled field pixel comprises averaging the second set of field pixels.

30.(Original) The method of Claim 25 wherein downscaling the third set of field pixels to generate a third downsampled field pixel comprises averaging the third set of field pixels.

31.(Original) The method of Claim 25 wherein downscaling the first set of field pixels to generate a first downsampled field pixel comprises low-pass filtering the first set of field pixels.

32.(Original) The method of Claim 25 wherein downscaling the second set of field pixels to generate a second downsampled field pixel comprises low-pass filtering the second set of field pixels.

33.(Original) The method of Claim 25 wherein downscaling the third set of field pixels to generate a third downsampled field pixel comprises low-pass filtering the third set of field pixels.

34.(Original) The method of Claim 25 wherein detecting comprises:
high-pass filtering the first downsampled field pixel, the second downsampled field pixel, and the third downsampled field pixel to generate a detected value; and
comparing the detected value to a threshold value.

35.(Original) The method of Claim 25 wherein detecting comprises:
high-pass filtering the first downsampled field pixel, the second downsampled field pixel, and the third downsampled field pixel using a $[-1/4, 1/2, -1/4]$ high pass filter to generate a detected value; and
comparing the detected value to a threshold value.

36.(New) The method of Claim 1 wherein said video signal is an interlaced video signal.

37.(New) The circuit of Claim 13 wherein said video signal is an interlaced video signal.

38.(New) The method of Claim 25 wherein said video signal is an interlaced video signal.

39.(New) A method for interpolating a pixel from a video signal, the method comprising:
downscaling one or more sets of field pixels to generate a plurality of downsampled field pixels; and
determining the slopes of a plurality of field pixels using the downsampled field pixels;
interpolating a slope for an interpolated pixel from the slopes of the plurality of field pixels; and
generating said interpolated pixel based on said interpolated slope.

40.(New) The method of Claim 39, wherein said video signal is an interlaced video signal.

41.(New) The method of Claim 39 wherein the one or more sets of field pixels includes a first set of field pixels, the first set of field pixels including field pixels from a field line having the first field pixel.

42.(New) The method of Claim 39 wherein the one or more sets of field pixels includes a second set of field pixels, the second set of field pixels including field pixels from a field line above a field line having the first field pixel.

43.(New) The method of Claim 39 wherein the one or more sets of field pixels includes a third set of field pixels, the third set of field pixels including field pixels from a field line below a field line having the first field pixel.

44.(New) The method of Claim 39 wherein downscaling comprises averaging a first set of field pixels, the first set of field pixels including at least 3 field pixels from a field line having the first field pixel.

45.(New) The method of Claim 39 wherein downscaling comprises averaging a second set of field pixels, the second set of field pixels including at least 3 field pixels from a field line above a field line having the first field pixel.

46.(New) The method of Claim 39 wherein downscaling comprises averaging a third set of field pixels, the third set of field pixels including at least 3 field pixels from a field line below a field line having the first field pixel.

47.(New) The method of Claim 39 wherein downscaling comprises low-pass filtering a first set of field pixels, the first set of field pixels including at least 3 field pixels from a field line having the first field pixel.

48.(New) The method of Claim 39 wherein downscaling comprises low-pass filtering a second set of field pixels, the second set of field pixels including at least 3 field pixels from a field line above a field line having the first field pixel.

49.(New) The method of Claim 39 wherein downscaling comprises low-pass filtering a third set of field pixels, the third set of field pixels including at least 3 field pixels from a field line below a field line having the first field pixel.

50.(New) The method of Claim 39 wherein determining comprises:
high-pass filtering the downscaled field pixels to generate a detected value; and
comparing the detected value to a threshold value.

51.(New) The method of Claim 39 wherein determining comprises:
high-pass filtering at least 3 downscaled field pixels using a $[-1/4, 1/2, -1/4]$ high pass filter to generate a detected value; and
comparing the detected value to a threshold value.

52.(New) A circuit for pixel interpolation, the circuit comprising:
a plurality of downscale circuits, each downscale circuit coupled to receive one or more sets of field pixels of a video signal, and each downscale circuit operable to generate one or more downscaled field pixels from the one or more sets of field pixels;
a plurality of edge detector circuits, each edge detector circuit coupled to receive one or more downscaled field pixels from a respective downscale circuit and operable to detect corresponding edges therefrom;
a field pixel slope determinator coupled to received the output of the plurality of edge detection circuits and determine field pixel slopes therefrom;
an interpolated pixel slope determinator coupled to receive the field pixel slopes and determine an interpolated pixel slope therefrom; and
an interpolated pixel generator coupled to receive the interpolated pixel slope and generate an interpolated pixel based thereupon.

53.(New) The circuit of Claim 52, wherein said video signal is an interlaced video signal.

54.(New) The circuit of Claim 52 wherein the one or more sets of field pixels include a first set of field pixels, the first set of field pixels including field pixels from a field line having the first field pixel.

55.(New) The circuit of Claim 52 wherein the one or more sets of field pixels include a second set of field pixels, the second set of field pixels including field pixels from a field line above a field line having the first field pixel.

56.(New) The circuit of Claim 52 wherein the one or more sets of field pixels include a third set of field pixels, the third set of field pixels including field pixels from a field line below a field line having the first field pixel.

57.(New) The circuit of Claim 52 wherein each downscale circuit averages a first set of field pixels, the first set of field pixels including at least 3 field pixels from a field line having the first field pixel.

58.(New) The circuit of Claim 52 wherein each downscale circuit averages a second set of field pixels, the second set of field pixels including at least 3 field pixels from a field line above a field line having the first field pixel.

59.(New) The circuit of Claim 52 wherein each downscale circuit averages a third set of field pixels, the third set of field pixels including at least 3 field pixels from a field line below a field line having the first field pixel.

60.(New) The circuit of Claim 52 wherein each downscale circuit low-pass filters a first set of field pixels, the first set of field pixels including at least 3 field pixels from a field line having the first field pixel.

61.(New) The circuit of Claim 52 wherein each downscale circuit low-pass filters a second set of field pixels, the second set of field pixels including at least 3 field pixels from a field line above a field line having the first field pixel.

62.(New) The circuit of Claim 52 wherein each downscale circuit low-pass filters a third set of field pixels, the third set of field pixels including at least 3 field pixels from a field line below a field line having the first field pixel.

63.(New) The circuit of Claim 52 wherein each edge detector circuit includes a high-pass filter.

64.(New) The circuit of Claim 52 wherein each edge detector circuit includes a $[-1/4, 1/2, -1/4]$ high pass filter.